A revisionary study of *Trachymyrmex zeteki* (Formicidae: Attini) and description of a new species, *Trachymyrmex fovater* sp. n.

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Introduction Fungus-growing ants are ubiquitous Neotropical insects with impressive diversity and fascinating evolutionary history. For 65 million years, ca. 250 species of fungus-growing ants have been refining their agricultural practices. *Trachymyrmex zeteki* Weber 1940 has been confused with a sister species due to confounding species descriptions, nearly identical morphological characteristics and overlapping habitats. We propose a new species, *T. fovater* sp. n., to resolve this taxonomic conundrum.

Statistical Analysis

Fig. 1

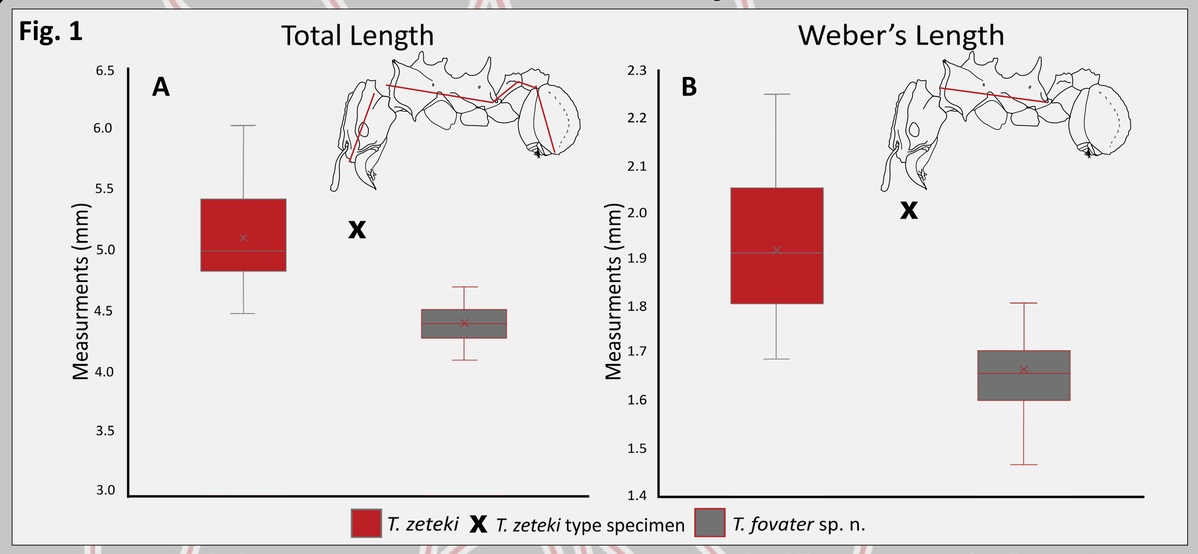


Figure 1 – Nine standard measurements and five extrapolated indices were used to differentiate species for all castes. Two measurements are included above (n= 106 *T. fovater*, 45 *T. zeteki*). X indicates the measurement of the *T. zeteki* type. A) Total length (Z-test; P< 0.001) B) Weber's length (Z-test; P< 0.001)

Molecular Analysis

Fig. 2

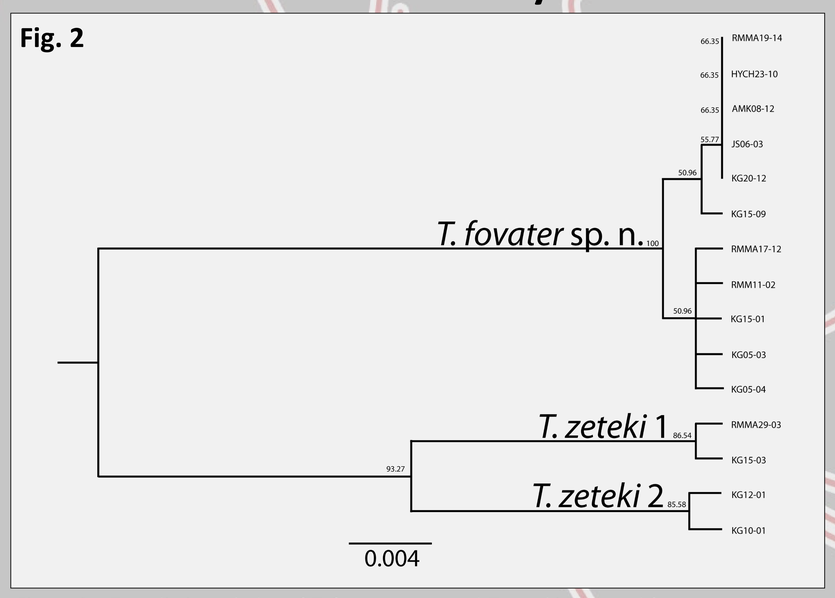


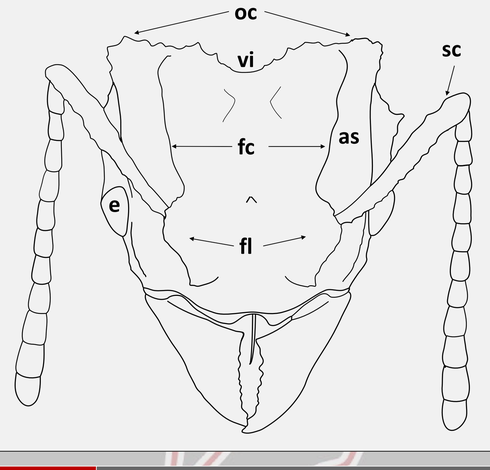
Figure 2 – Two distinct clades of *T. fovater* sp. n and *T. zeteki* emerged from our phylogenic analyses of 15 colonies (397 bp of COI).

Selected Morphological Differences

Fig. 3

Illustrated Morphology

as – antennal scrobe
e – compound eye
fc – frontal carina
fl – frontal lobes
oc – occipital corners
sc – scape
vi – vertex impression



Trachymyrmex zeteki	*Trachymyrmex fovater* sp. n.
A - Simple setae present mesad of the frontal carinae	**A** - Spatulate bi-colored setae mesad of the frontal carinae
B - Eyes' anterior half surpasses the lateral margin of the head	**B** - More than half of the eyes' anterior half surpasses the lateral margin of the head
C - Distinct acumination on the anterior-lateral margin of the frontal lobes	**C** - Weak acumination on the anterior-lateral margin of the frontal lobe
D - Antennal scapes, when lodged in antennal scrobe, reach, but do not surpass occipital corners	**D** - Antennal scapes, when lodged in antennal scrobe, surpass occipital corners of the head
E - Deep and wide vertex impression	**E** - Shallow and narrow vertex impression

Fig. 4

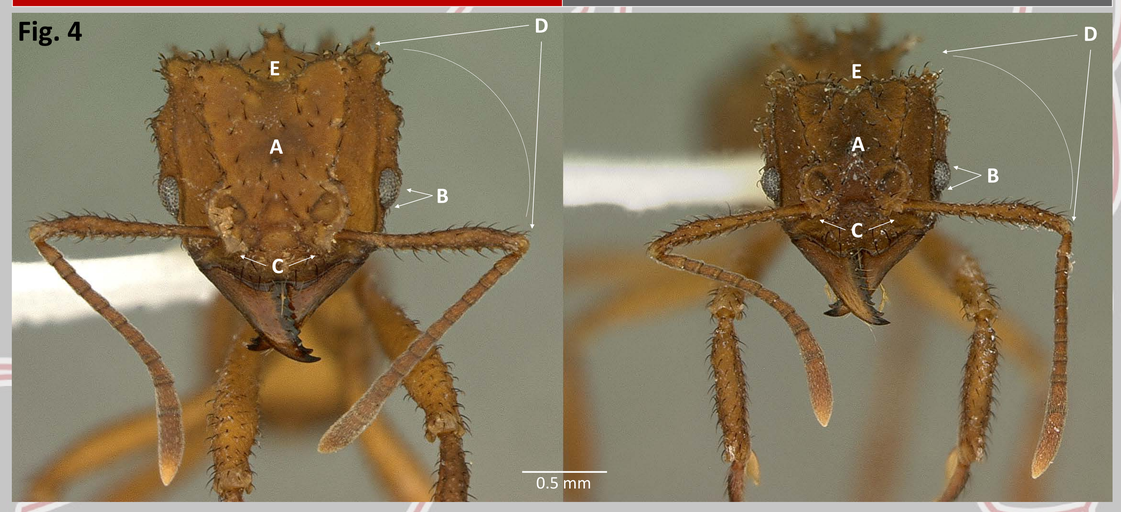


Figure 3 – Morphology of the worker head capsule referenced. Table 1 & Figure 4 – Illustrates key diagnostic characters which are referenced in Table 1 for comparison to Figure 4.

Methods

Fig. 5

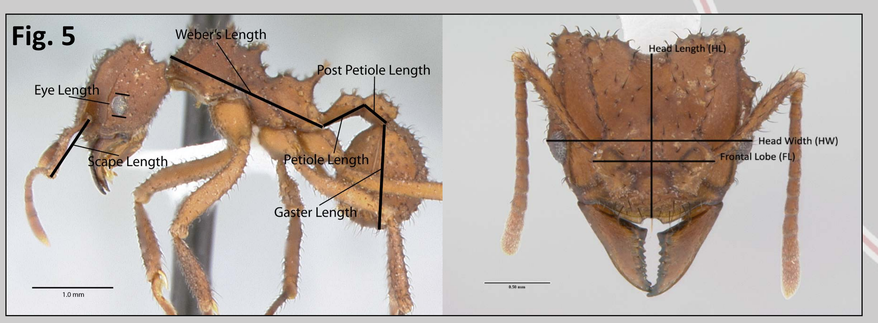


Figure 5 – Morphology: Nine standard measurements
Molecular: Extracted DNA from 40 colonies using a Qiagen Blood and Tissue kit. COI gene was amplified using Jerry/Ben Primers (Simon et al. 1994). OSU's Plant-Microbe genomics facility was used for sequencing and data analyzed with Geneious R9

Conclusion

- Based on 32 morphological differences in workers, gynes, and males, we conclude that *Trachymyrmex fovater* sp. n. has been incorrectly identified as *T. zeteki*
- Molecular differences corroborate our morphological evidence and distinguish two clades (Fig. 2)

Future Directions

- Use additional primers of COI and genes to improve the phylogenetic resolution
- Examine male genitalia to find informative characters that separate the *T. zeteki* clade
- Identify and list all publications that have incorrectly named *T. zeteki*

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